

A MEXICAN PINE PROMOTED TO SPECIFIC STATUS: PINUS PRAETERMISSA

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George Russell Shaw, in his detailed revision of the pines of Mexico (1909), considered the widespread *Pinus oocarpa* to be a species easily recognized because of the characteristic lustrous hard broadly ovoid cones and the prevalence of septal resin ducts in the leaves. He was sufficiently impressed by the cones to use them as the primary basis for a new taxon which he called *Pinus oocarpa* var. *microphylla*, which he knew from three collections, and which he described briefly as follows: “Leaves much shorter and more slender than those of the species, 8–13 cm long.” In discussion he went on to say, “The cones are distinctly of the *oocarpa* form, although with thin scales and slender peduncles, but the leaves are very much shorter and thinner than those of the species and, were it not for the cones, would scarcely be recognized as belonging even to a variety of *P. oocarpa*.”

There is unquestionably a striking similarity between the unopened cone of *Pinus oocarpa* Schlecht. and that of the so-called var. *microphylla*. Because of this, and perhaps because few collections of the latter have been available until recent years, it seems that no one except Shaw has ever noticed that the two taxa are very different in most ways except for the shape of the cone. Recent workers have accepted the dictum of Martínez (1948, p. 312), who wrote, “[los conos] por su aspecto se asemejan tanto a los de la especie típica [i.e., *P. oocarpa* var. *oocarpa*], que no se podría distinguir la variedad sin el examen de las hojas.” Loock (1950, p. 219), who copied freely from the work of Martínez, translated the above as “without leaves it is impossible to separate this variety from the species”. The truth is in fact rather different.

After the cones have opened the differences between those of the two taxa become more apparent. The cones of *P. oocarpa* tend to persist on the branches, whereas those of the other taxon fall away, leaving some of the basal scales attached to the peduncle. The cones of *P. oocarpa* characteristically open very widely and concentrate the scales toward the base, so that the extreme manifestation of this suggests a symmetrical basal rosette with a few of the central scales projecting upward. In “var. *microphylla*”, on the other hand, the cone-scales, though opening widely and sometimes recurved, are more evenly distributed along the axis.

Various authors have mentioned the differences in the length of the sheaths, and in the length and width of the leaves, that separate typical *P. oocarpa* from the so-called var. *microphylla*. Not previously mentioned, as far as we know, is what seems to be a more fundamental difference, namely the number of rows of stomata

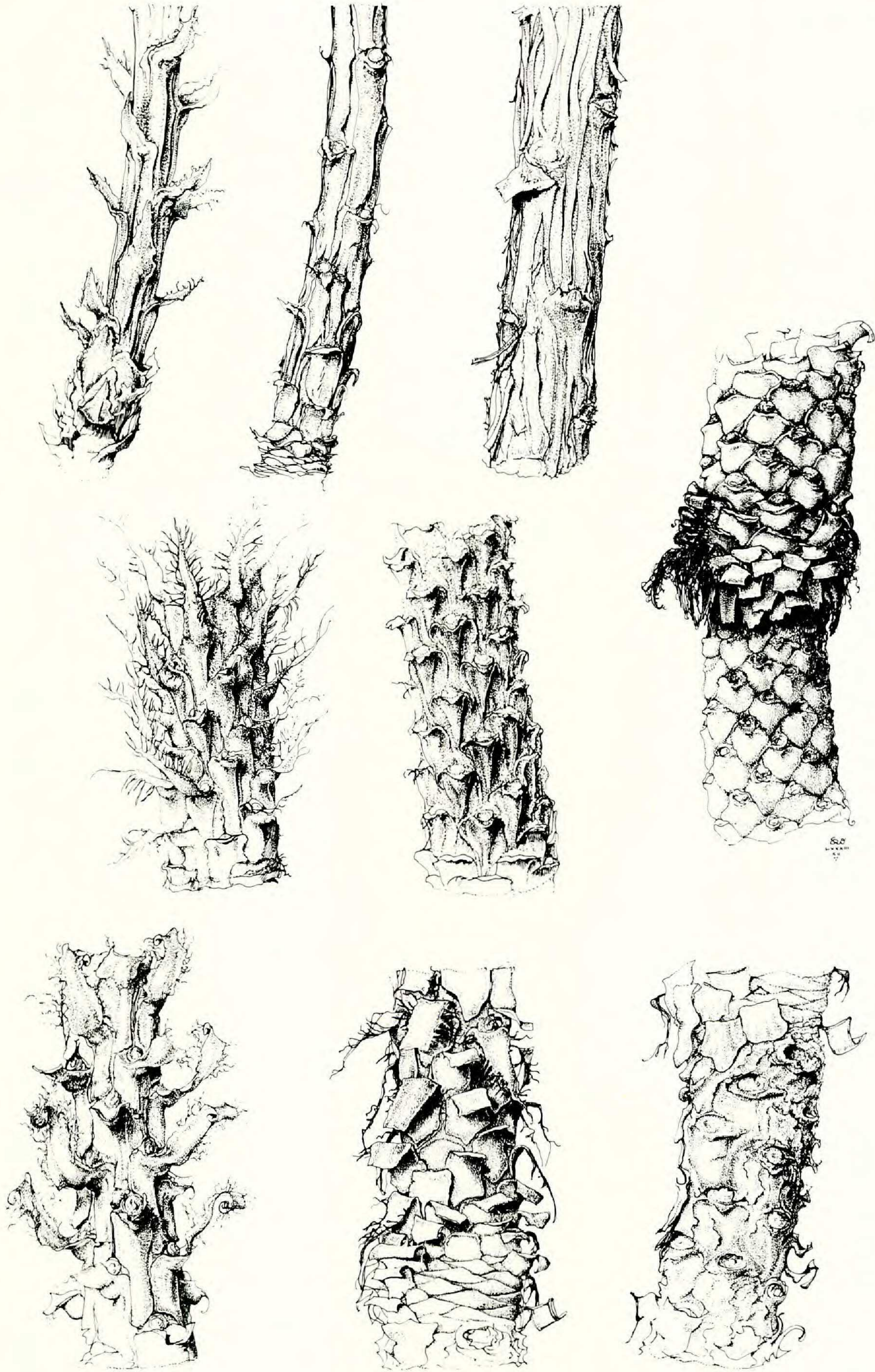
on the external face of the leaf. The smallest number (usually 3–5) in “var. *microphylla*” is not necessarily correlated with smaller and narrower leaves; for example, in the leaves of *Pinus durangensis*, which are 0.8–1.2 mm wide, about the same width as those of *P. oocarpa*, the stomata are usually in 2–4 rows only. In *P. oocarpa* the number of rows is commonly 6–10. The presence of fewer or more numerous stomata usually does not in itself suffice to differentiate between related species, but the numbers do seem to be well correlated with certain taxonomic groups of species of *Pinus*. In the complex called the *pseudostrobus* group, for example (Stead & Styles 1984), the stomata are almost without exception in 2–5 rows, whereas in the complex that includes *Pinus montezumae* the number of rows is commonly 5–9. In *Pinus pringlei*, a species often linked taxonomically with *P. oocarpa*, the stomata are often in 9–11 rows.

Differences between the branchlets of *Pinus oocarpa* and those of “var. *microphylla*” are as notable as those between the leaves of the same taxa. Superficially it is readily noted that the branchlets of *P. oocarpa* are thicker and rougher. Closer observation discloses that the decurrent bases of the fascicle-bracts, which completely cover the young twigs, commonly begin to peel away before the end of the first season and exfoliate in the form of coriaceous scales during the second season. A similar sequence takes place in various other species of Mexican pines (Fig. 1). Almost unique, however, is the situation in “var. *microphylla*.” The decurrent bases of the bracts are never, as far as we have observed, deciduous; they remain on the twigs for several seasons, and split into longitudinal strips as the twig increases in diameter.

Differences in leaf anatomy appear clearly to separate *P. oocarpa* from “var. *microphylla*,” though the latter is perhaps insufficiently known. The 5–8 septal resin ducts attributed to *P. oocarpa* make that species almost unique in respect to that feature (*P. pringlei* is reported to have 4–7 resin ducts, some of which may be septal). Both in *P. oocarpa* and *P. pringlei* the hypodermis forms significant intrusions into the chlorenchyma. In “var. *microphylla*,” which appears to have usually 1 or 2 internal resin ducts and a thin uniform hypodermis of two layers of cells, the anatomy seems distinctively different, though as noted above there are reports that septal resin ducts may occur.

It is perhaps too soon to speculate upon the relationship between this newly segregated species and other Mexican pines. Obviously the form of the cone, and also the fact that the wing of the seed is firm and thickened at base, suggest some affinities with *P. oocarpa*. The leaves and the branchlets suggest a possible affinity with the *pseudostrobus* group.

FIG. 1. Details of pine branchlets, showing changes in surface features after maturity. Top row, $\times 2.5$, *Pinus praetermissa* (Bauml & Voss 1130). Current season (left), bracts with decurrent bases (after removal of leaf-fascicles); two seasons earlier (center), some lateral separation between, and longitudinal splitting in, the decurrent bases; an older twig (right), the longitudinal splitting evident. Second row, *Pinus hartwegii* (Palacios s.n., México), $\times 1.5$, and (far right) *Pinus devoniana* (Mexia 1627), $\times 1$. Current season (left), bracts with decurrent bases as above; two seasons earlier (center), the decurrent bases persistent, closely imbricated and essentially unchanged after the fall of the leaf-fascicles and the free tips of the bracts; at right a node [of *P. devoniana*] separating a two-year-old segment of a twig (above) from a segment a year older, the bracts more or less persistent at the node, the internodes wholly exposed after the fall of all bracts including their decurrent bases. Bottom row, $\times 1.5$, *Pinus oocarpa* (Feddem 174). Current season (left), bracts with decurrent bases as above; two seasons earlier (center), the decurrent bases above a node beginning to loosen and exfoliate; one season still earlier (right), most of the decurrent bases having fallen, the internode showing further exfoliation of papery layers of the cortex.



Pinus praetermissa Styles & McVaugh, sp. nov., arbor mediocris, irregulariter ramosa, ramulis tenuibus, glabris; bractearum (foliorum primariorum) bases decurrentes persistentes, vix squamatim deciduae sed demum (ramulis vetustioribus incrassatis) longitudinaliter fissae; folia in fasciculum 5, gracilia, plerumque 8–16 cm longa, 0.5–0.7 mm lata; stomata superficiei externae (2–) 3–5 (–?6)-lineata; vaginae persistentes, primum castaneae, demum pallidiores vel nigrescentes, 11–14 mm longae, 1.3–1.5 mm diametro, prophyllorum carinis 1.5–3 mm longis; strobili late ovoidei, (4.5–) 5.5–7 cm longi, aperti vix longiores quam latiores; squamae durae, laeves, apophysibus protuberantibus, nunc convexis, nunc pyramidalibus, umbone centrali, parvo, plusminusve concoloro, interdum aculeato; strobili maturi longe non persistentes, squamis basalibus nonnullis secedentibus et pedunculo 3–3.5 cm longo insidentibus; seminis ala basi incrassata. Fasces vasculares 2, approximati; canales resiniferi 1–2 (–?4) interni, vel (ex Shaw) 1 septalis; hypodermis uniformis, in chlorenchyma non intrusa. *Pinus oocarpa* var. *microphylla* Shaw (Pines Mex. [Publ. Arnold Arb. 1]: 27. pl. XX, figs. 2, 5, 8–11. 1909), sed ab *P. oocarpa* Schlecht. praeter strobili formam toto caelo diversa. Fig. 2.

MEXICO: Sinaloa (Colomas, *Rose 1755*, US 300624-5, lectotype here designated of *P. oocarpa* var. *microphylla*; A*, isolectotype), ?southern Zacatecas, Nayarit (Mpio. Jala, Juanácata, *Stead & Styles 475*, FHO, the holotype; ENCB, MEXU, isotypes), Jalisco, there chiefly in the lower basin of the Río Grande de Santiago. A tree of open, seasonally dry woodlands, oak forest or tropical deciduous forest or sometimes with other pines, at elevations from 900 to 1700 m above sea-level, the cones ripening in December and later.

A medium-sized tree, sometimes bushy and fruiting when no more than 5 m high, often reported as 12–15 (–20) m high with trunk up to 30 cm in diameter; branching reported from one collection (*McVaugh 19030*) as “deliquescent as in hardwoods”; branchlets flexible, slender, the leaf-bearing zones in the first and second seasons reddish brown, 2–4.5 mm thick; leaf-fascicles in about 8 vertical rows on the branchlets, those in any row often separated by intervals of 1–2 cm; leaves mostly 8–16 cm long, 0.5–0.7 mm wide, apparently light green, ascending on the branchlets but flexible, minutely serrulate, in fascicles of 5 as far as known; stomata present on all faces, those on the outer face in (2–) 3–5 (–6?) rows; fascicle-sheaths persistent, 11–14 mm long, 1.3–1.5 mm in diameter, at first light reddish brown, in age turning to gray or chestnut; prophylls 1.5–3 mm long; bracts (primary leaves) subtending new fascicles narrowly triangular, tapering to a very sharp erect point, 4–10 mm long (the lower, older ones longer), 1–2 mm wide at base, the free blades thinly papery even in age, not resinous, with pale thin ciliate-fringed or narrowly hyaline margins; bases of the bracts somewhat indurated and projecting, gradually eroding with age, their decurrent margins not exfoliating, commonly remaining attached and splitting longitudinally as the twig thickens; cones before opening almost exactly simulating those of *Pinus oocarpa*, i.e., broadly ovoid and short-acute, essentially symmetrical, light brown, smooth and even or sometimes with protuberant apophyses, (4.5–) 5.5–7 cm long, on rather more slender peduncles 3–3.5 cm long and 3–4 mm thick; cones opening widely, then commonly about as long as wide, the scales not becoming crowded toward the base as in *P. oocarpa* but more uniformly spreading-ascending or recurved; up to ca 25 of the small basal scales persistent on the peduncle when the cone falls, leaving a scar up to 3 cm across at the base of the cone; seed-wing thickened (1–1.5 mm thick) above the base.

Leaf-anatomy: Vascular bundles 2, approximate; hypodermis not forming sig-

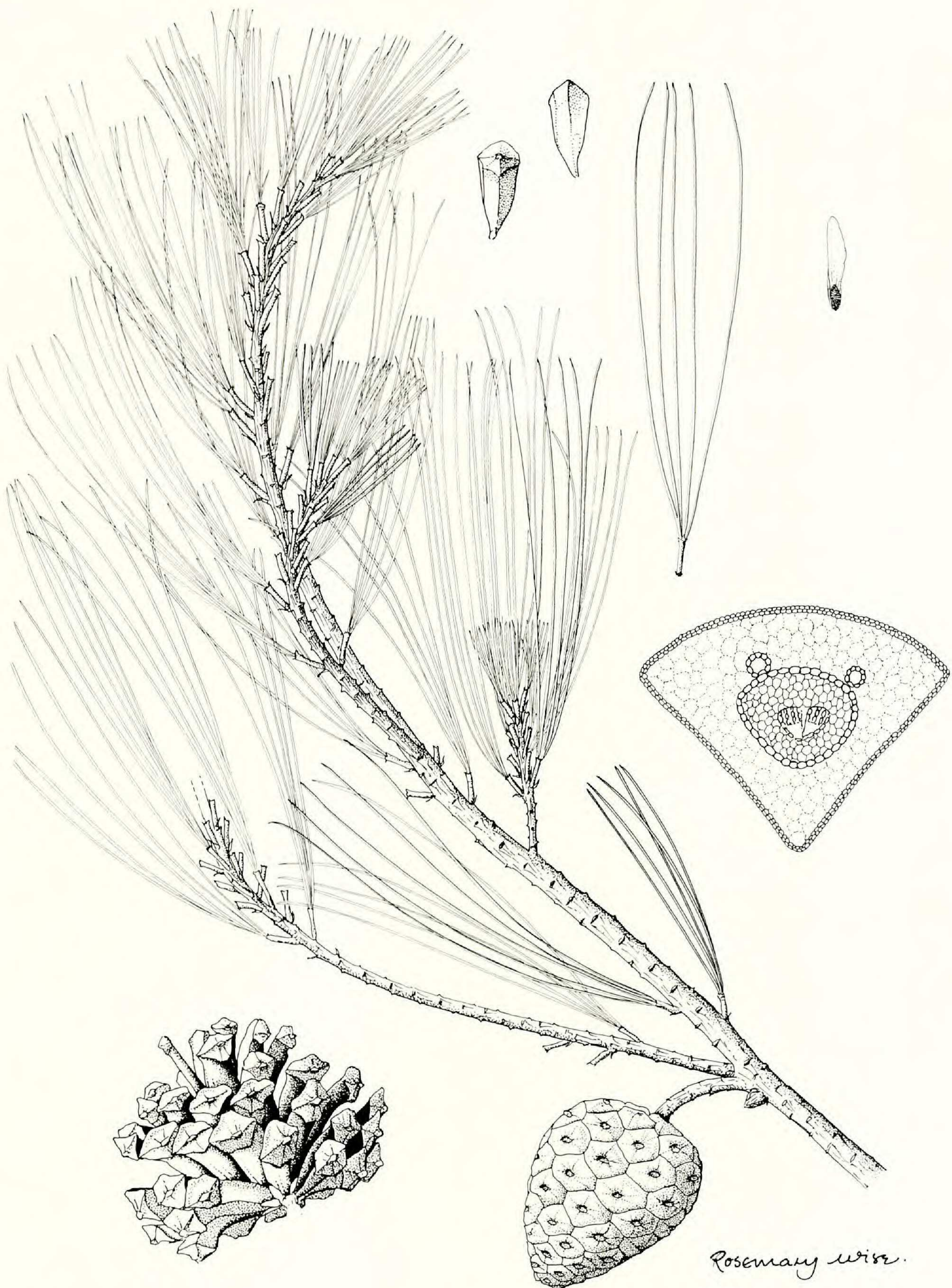


FIG. 2. *Pinus praetermissa* (Wilkinson & Styles 2, drawn by Rosemary Wise). Habit, fallen cone lacking basal scales which persist on peduncle, cone scales, fascicle of 5 leaves, and seed, all $\times 0.5$; needle section $\times 70$.

nificant intrusions into the chlorenchyma, uniformly (according to Martínez, 1948) of 2 rows of cells; resin ducts 1 or 2 (–4, according to Loock, 1950), internal, or “sometimes with one or two septal” (Loock 1950, p. 218; cf. also Shaw 1909, *pl. XX, fig. 11*); outer walls of the endodermal cells thickened.

ADDITIONAL SPECIMENS EXAMINED (Cited specimens, unless otherwise noted, were studied by both authors, except those marked with an asterisk (*), which were reviewed by Styles only, and those marked by two asterisks (**), reviewed by McVaugh). NAYARIT: “Pedro Paulo [Pablo] to San Blasato [Blasito]” (*Rose 1997*, A**, US*, paratype of var. *microphylla*); Jesús María (*Díaz Luna 9582*, not seen; GUADA, according to S. Carvajal *in litt.*); El Magueyito, 4.5 mi N of Santa Cruz del Guaibiel (*Bauml & Voss 1130*, MICH, US**); 4 km S of Santa Cruz Guayabel, 1700 m (*Pérez de la Rosa et al. 1522*, IBUG**); Tepic (*Palmer 1998 in 1892*, A*, US*, paratypes of var. *microphylla*); Nay., Jalisco, La Rosa (collector unknown; *Martínez 3459*, MEXU 275012); “3.5 mi” W of Jalisco (*A. R. Phillips in 1956*, MICH); Santa María del Oro, oak forest in the basin of La Laguna (*Cházaro 736*, ENCB*, with cone; *McVaugh 19030*, MICH; *Pérez de la Rosa 200*, IBUG**; *Rzedowski 37542*, ENCB*, with cone).—JALISCO: road to Hostotipaquillo, from the Guad.-Nogales road (*Wilkinson & Styles 2*, FHO*, with cone); Cerro de Tequila (1700 m, *C. Castillo G.*, IBUG**, with cone; “5200 ft,” *Webster & Breckon 15970*, DAV**, with cone; MEXU, MICH). Otherwise unknown to us; reported by Martínez (1948, p. 313) from Ixtlán del Río, Nay., and Nochistlán, Zac., and (a form with long-ovoid cones 7 cm long and 3 cm in diameter), from Cuale, Jal.

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